ChimClean

Overview
Our team set out to design a low-cost chimney cleaning system that would improve on the existing prototype of the sponsor. The main challenge of the project was designing one product that could fit the various sizes of circular, square, and rectangular chimney flues, while keeping high manufacturability and low production costs.

Objectives
The objective of our team was to successfully design and build a fully functional, inexpensive, and universal chimney cleaning system. The goal was to meet all the design criteria with as little cost as possible.

Approach
- Gathered the customer needs, such as universality, low production cost, high manufacturability, etc
- Ideas were brainstormed without analysing existing products to not hinder our creativity
- Decided on a three-component internal design with a top pulley support, adjustable brush, and a hand-crank base
- With a basic final design in mind, hand drawings were made for each individual component
- Final CAD models were produced for each of the three parts
- Construction of the prototype began, while continued improvements were made throughout the process
- Preliminary testing was performed for each component individually on purchased terracotta insert
- Final system was tested on sponsor's home chimney in St. Mary’s PA
- Successes and failures of testing were evaluated

Outcomes
Completion of the final chimney cleaning system was successful. The successes and suggestions for improvements are listed below

Successes:
- Successful:
  - Creosote clean up
  - Proof of internal design concept
  - Low production cost achieved
  - Universality of all 3 components successful
- Needs improvement on:
  - Installation procedure
  - Maintaining cable tension